

OLOGUNAGBA BRIGHT TOLUWALOPE

ELECTRICAL AND ELECTRONICS ENGINEERING

18/ENG04/062

IDENTIFICATION AND SELECTION

i. TOPIC: VEGETABLE FARMING

Here are a few steps however you should consider when starting your farm:

1. **Startup capital.** Just like most businesses, the capital required to begin vegetable farming is largely dependent on the scale the farmer wants to operate. In Nigeria today, it is estimated that you need between #50,000 and #60,000 to start a vegetable farm on an expanse land of about one or two hectares, depending on your location. This amount of money covers major inputs like seedlings, labor, manure, pesticides, farm implements, etc.
2. **Site selection.** It is imperative that the farmer takes proper care in studying the land he wants to use to cultivate, especially if he has an intention of going beyond backyard vegetable production. Several soil attributes like the topography, water content and retention capacity, soil type, etc. should be studied intently before delving into production.

The topography deals basically with the physical outlook of the soil such as the presence of slope, how prone the soil is to erosion, presence of rocks or other underlying materials,

presence of tree cover, etc. These can in one way or the other affect the growth rate and survival of the vegetables.

The best soil type for vegetables is loam soil or humus soil as they contain high amounts of nutrients needed by the vegetables for quick growth. However, the soil can be augmented by the addition of manure (most advisably organic manure). Vegetables also need considerable amount of water, the site chosen must be one that has access to water, though the water retention must be average as too much water could lead to erosion and consequent loss of the crops.

3. Field Topography –

Topography refers to the physical characteristics of the overall field site and includes such conditions as; contour, soil depth, water and air drainage, and, the presence of rock out cropping and trees. An ideal topography for vegetable production is one that is nearly flat to slightly sloping, well drained, and, free of trees, rocks and low areas. Efficiency of crop maintenance, irrigation and harvest operations is greatly enhanced in fields with this type topography.

4. Soil type and quality –

Soil type refers to the physical composition or properties of the soil. Soils basically consist of decomposed mineral matter (sand, silt, and clay) and decomposed organic matter. Optimum vegetable production is achieved on well-drained sandy loam soils. Although vegetables can be grown on a wide range of soil types, most vegetables are not well adapted to heavy clay soil types. Soils of this type tend to have poor aeration

and drainage and can restrict root growth. Soil quality influences its ability to provide an optimum media for growth, sustain crop productivity, maintain environmental quality, and, provide for plant and animal health.

ii. PREPARATION AND ANALYSIS/ APPRAISAL

In preparation and analysis, a feasibility study is required. Therefore, for our feasibility, the vegetables we are putting into consideration is tomato.

Assumptions of vineyard establishment and production costs

The business development plan is devised for a 0.6 hectare of vineyard. There will be purchase of vineyard related equipment such as shovels, spades, drip pipes, hedger, sprayer and harrows and motor pump or dynamo for irrigation at an investment of \$ 250,000. Other expenses might be required such as expenses for personal, grape processing machine, store house, sale houses, vehicles for transport, and buildings for offices, office furniture and stationeries.

Farm land tax will be calculated as per the tax regulation of the government of Nigeria for rent land taxes to investments in Agriculture

- The farm design will consist 40 rows 50 meters long each with 1.3 meters spacing of vines and spacing of 2.5 meters of a row. There will be approximately 1,539 vines/farm land.
- Vertical shoot positioning system is being used as a trellis (supporting) system.
- Expenses for land preparation are based on cultivated land that need some amendments and land clearing.
- Farm land rent and/or compensation costs are not dealt in this study due to dynamic governmental land policies and variations in land prices and values in the community. For this

reason, it is important to consider for the land expense if any interested want to use this document in planning of any vineyard.

Vegetable production costs and returns

Variable costs: Costs that change directly with an increase or decrease in the farm land are called variable costs. These include costs for trellis materials, pesticides, fertilizers, labour and expenses for machinery rents.

Fixed costs: Fixed costs do not or slightly change because of an increase or decrease in any expansion in the vineyard. Expenses for motor pump, drip irrigation equipment, and taxes are examples of fixed costs.

Year 1: Planting Year – Costs

There is a significant capital investment requirement for the vineyard in the year of planting.

The cost of vine seedlings accounts much of the costs in the planting year, followed by labour and the cost of supplies for the trellis system for this particular farm.

The labour expense will vary depending on the amount of labour needed to hire, the availability of the labour, and the wage expected by the labour pool available at the time of planting. For this particular farm, neighbour farmers as labourers which is valued even if not using cash to pay for it directly.

S.No.	Items for Variable Costs	Cost per farm (Naira)
1.	Gardeners (hired labour)	14,000.00

2.	Vine seedlings	23,085.00
3.	Trellis Supplies	5,000.00
4.	Equipment for cultivation	3,548.00
5.	Wires	2,376.00
6.	Grow Tubes	6,785.00
7.	Anchors	2,345.00
8.	Tying Material	384.00
9.	Steel Stalk for supporting vines	7,347.00
10.	Pesticides	520.00
11.	Soil Testing and Amendments	5,615.00
12.	Cover Crop	621.00
13.	Motor pump Expenses (maintenance and fuel)	2,167.00
	Total variable costs	73,793.00
	Fixed Costs	
	Taxes	
	Total Cost	73,793.00

Table 1: Establishment Costs per farm– Year 1: Planting Year.

Year 2: Growth Year

Vines are planted to grow and established well in the third year. There will be a need to incur costs in areas of labour, fertilizer, pesticides, stalks and tying materials. Consultants and trainers will be invited from Axum university college of Agriculture and research centres in occasions whenever assistance is needed. In the growing year there is no expectation for economic yield and so as any revenue. The vineyard farm will require 1,539 vines. This is calculated based on the supposition that the vines are planted at 1.3 m spacing in 40 rows 50 meters in length spaced at 2.5 m apart the. The costs of vines will vary depending on seasonality and the cultivars. The estimated cost for this farm is \$15/vine.

S No.	Activities (Variable Costs)	Cost per Item per Year (Naira)
1	Labour (gardeners)	14,000.00
2	Viticulture	4,467.00
3	Specialists for Consultancy and trainings	10,000.00
4	Vines (2%) replacement	462.00
5	Trellis (support materials) Supplies	1,870.00
6	Wires	1,300.00
7	Tying Materials	145.00
8	Pesticides	560.00
9	Plant leaf analysis, Soil Testing and Amendments	12,475.00
10	Taxes and Land rent	
	Total Expenses	45,279.00

Table 2: Establishment Costs per farm – Year 2: Growth Year.

Production Years: Third year and Beyond

Economic yield will begin to emerge in the fourth year of the establishment in most vineyard farms. Starting from the fourth year a grower can expect return in the expense of his costs. There might be extensions of the first harvest years’ due varieties and whether conditions.

However, there should be expectations of some production constraints, risks, catastrophes and changing costs which will demand additional expenses. The general expectation of revenue trends in most vineyard farms revealed that, there is an increase throughout the production years. Particularly in our country there is a linear increase in demand of vegetables so as the market price will influence positively the revenue of such enterprises that are very limited in number.

S. No.	Activities and Items of Variable Costs	Cost Per Item Per Year (Naira)
1.	Hired Labour (Guards and gardeners)	14,500.00
2.	Consultancy and training	10,000.00
3.	Viticulture / Pruning	5,300.00
4.	Trellis Supplies and Tying Material	654.00
5.	Pesticides	560.00
6.	Soil Amendments and Testing	5,615.00
7.	Motor pump Expenses (maintenance and fuel)	3,500.00
8.	Harvesting cost	3,300.00
9.	Bird Control	1,906.00

10.	Harvest materials and Transportation	1,378.00
11.	Storage materials	1,476.00
Fixed Costs		
	Taxes and land rent	
	Total Expenses	48,189.00

Table 3: Costs of a Farm to Operate a Mature Vineyard.

Vineyard Establishment Costs

Vineyard owners are required to manage three consecutive years of establishment costs prior to any revenue being received it is often necessary to accumulate the establishment costs until such time as a crop is harvested and revenue is received during evaluation of a vineyard enterprise. The establishment costs in each of the three years along with their respective interest charges should be accumulated to the fourth year using an interest rate of 5% compounded annually. The total compounded amount represents the cost of establishment of the vineyard that is assumed to be repaid over a period of years of harvesting for financial analysis purpose.

Economic analysis on production costs can be made using assumptions of interest rates based on the countries investment incentives in which it is stated with free or a minimum interest rate debt. However, for the sake of economics of the farm let interest rate be considered 5%. Hence, it is possible to calculate how much to pay to finish credits in certain years.

To devise an approach to production costs, it is necessary to consider constant costs and returns for each of the succeeding harvesting years. The total cost of establishment should be amortized and the repayment of these costs must be divided equally over the harvest years. Realizing that the establishment

of the vineyard increases the asset value of the land, the grower is able to depreciate the costs annually over a defined number of years of actual harvesting periods (Tables 5 and 6).

Year	Cost of Establishment	Interest (5%)	Total Amount
Pre-planting	249,053.00	12,452.65	261,505.65
Planting	73,793.00	3,689.65	77,482.65
Year 3	45,279.00	2,263.95	47,542.95
Total	368,125.00		386,531.25

Table 4: Summary of Establishment Costs of the Farm Assuming Financial Requirements in 5% Interest Rate.

Total Amount	368,125.00	386,531.25
Interest rate	No interest	5%
Term	15 years	15 years
Yearly Payment	24,541.67	25,768.75

Table 5 The amortization of the total three-year establishment costs of the farm over a 15-year period at an interest rate of 5%. Amortization of Establishment Costs of the farm.

IMPLEMENTATION AND MONITORING

By making assumptions of the interest rate at 5% the total initial investment will amount to \$386,531.25. In amortizing this initial investment, the grower can pay all in a certain term. For example, for this farm it is assumed that the payback will be done in 15 years with \$ 25,768.75 annually. Comparisons of returns and costs revealed that there is a significant profit earned after growing years over the investment costs. Significantly increased revenue from 129,000 at growth year 4 to \$ 270,000 is recorded throughout production years (Table 7).

Year of cultivation	Yield ton/.6Ha	Revenue (₦)	Variable Costs (₦)	Fixed Costs	Total Costs (₦)	Net Cash Flow (₦)	Accumulated Profit (₦)
Pre-planting	0	0	44,053	205,00	293,053	-293,053	-293,053
Planting	0	0	73,793		73,793	-73,793	-366,848
3.	0	0	45,279		45,279	-45279	-412,143
	2.15	129,000	48,189		48,189	80,811	-331,332
	3.5	210,000	48,189		48,189	161,811	-169,521
	4.5	270,000	48,189		48,189	221,811	52,290
	4.5	270,000	48,189		48,189	221,811	274,101
	4.5	270,000	48,189		48,189	221,811	495,912
	4.5	270,000	48,189		48,189	221,811	717,723
	4.5	270,000	48,189		48,189	221,811	939,534
	4.5	270,000	48,189		48,189	221,811	1,161,345
	4.5	270,000	48,189		48,189	221,811	1,383,156
	4.5	270,000	48,189		48,189	221,811	1,604,967

	4.5	270,000	48,189		48,189	221,811	1,826,778
	4.5	270,000	48,189		48,189	221,811	2,048,589
	4.5	270,000	48,189		48,189	221,811	2,270,400
	4.5	270,000	48,189		48,189	221,811	2,492,211
	4.5	270,000	48,189		48,189	221,811	2,714,022
	4.5	270,000	48,189		48,189	221,811	2,935,833
	4.5	270,000	48,189		48,189	221,811	3,157,644

Table 6: Forecasted Economic Analysis of the farm for twenty growing years.

EVALUATION

The report finally got very courageous recommendations to all interested to enter in to the very profitable business and invites all responsible donors to finance such fast growing, ecologically sound, socially acceptable, beneficial to many in the community and sustainable enterprise.

Revenues or any return do not fully begin until the production year (third year) in any investments of a vineyard. However, it is not beyond the production that a vineyard owner should expect matured grapes to harvest a satisfactory yield for commerce. In general, tomato growers should expect an average yield to be about 7.5 ton/Ha in optimal growth resourced farm with good managers. There are some cultivars that could produce yields of 8.5 to 10 ton/Ha.